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(54) **Composite skate boot, and method of shaping it.**

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Description

The present invention relates to a skate boot, particularly to a skate boot of the type used for ice hockey, and to a method of forming the same.

Hockey skate boots, presently, can be classified either as leather boots if the skate boot is manufactured, using a last, with different materials including leather, nylon, fabric and fibre material inlays, or as molded skate boots, if the boot includes a molded plastics shell with an inner slipper.

Leather skate boots on the one hand require the use of a last and considerable, skilled, hand labor to construct. The cost of the material is high as well as the resultant labor. Although a leather skate boot has the advantage of molding itself to the foot, providing flexibility where necessary, it has a tendency to "break" or lose its strength in the ankle area and the area of the Achilles tendon. Leather breathes well, but it also wears more easily.

The molded plastic skate boot on the other hand is usually molded in a two-part shell, including:

a lower comprising sole, toe, metatarsal and heel portions of the boot, and being made of a molded, unitary, rigid plastics material;

an upper including an upper tendon guard covering the upper portion of the Achilles tendon.

The upper is pivotally mounted to the lower, and a separate slipper made of foam or the like material is provided within the shells adapted to form itself to the foot of the wearer.

Such a skate boot is e.g. disclosed by the US—A—4 107 856.

However, the skate is not fully responsive to the thrusts of the foot since some of the force being transferred to the foot laterally, or torque-wise, is being lost due to movement of the slipper relative to the plastic molded shell. This power loss is especially noticeable in high performance skates utilized by professional hockey players.

Furthermore, it has been observed that when the laces are being tightened to close the skate on one's foot, the distribution of the pulling forces caused by the laces tends to be equally distributed along the sidewalls of the lower where in fact it is preferable to have varying tension forces along different parts of the sidewalls. Although the slipper gets molded to the foot, the plastic shell does not in the light of its inherent rigidity. Furthermore, there is very little lateral flexibility in the area of the ankle. In power skating, acceleration is affected by the degree of flexibility in the ankle area of the boot.

It is an aim of the present invention to provide an improved skate boot incorporating the advantages of both the conventional leather skate boot and the molded plastic skate boot.

It is a further aim of the present invention to provide a composite hockey skate boot having a rigid molded plastics lower with an upper of relatively flexible material especially in the area of the ankle, the upper being integrally attached to the lower.

A construction in accordance with the present invention is characterized in that it further includes:

an intermediate portion between the lower and the upper, said intermediate portion comprising ankle and Achilles tendon portions of the boot, and being connected to the upper edge of the lower, and the upper being connected to the upper edge of the intermediate portion,

and an inner liner fixed to the lower, the intermediate portion and the upper;

in that the upper further includes a pair of eyelet bands, a collar and an Achilles tendon back depending therefrom,

and in that the intermediate portion is made of a molded plastics material relatively softer that the material utilized for the lower such that the intermediate portion is relatively flexible compared to the lower, while the upper is made of leather or the like pliable material such as to take the form of the foot through repeated use.

Preferred embodiments and specific features are set forth in the sub-claims.

A method of forming a skate boot in accordance with the present invention comprises the steps of:

molding, from plastics material, a lower of unitary construction defining sole, toe, metatarsal and heel portions of the boot provided with an upstanding continuous edge defining in part an opening for receiving eyelet bands and an intermediate portion;

molding, from plastics material relatively softer than the material utilized for the lower, an intermediate portion, such that said intermediate portion is relatively flexible compared to the lower;

fixing an upper including eyelet bands to the upper edge of the intermediate portion at least along the sides thereof;

forming an inner liner and fixing the inner liner to the upper and intermediate portion;

inserting the so-formed assembly into the lower, and

fixing the intermediate portion along its sides to the upstanding edge of the lower and otherwise fixing the inner liner as well as the eyelet bands of the upper to the lower.

Having thus generally described the nature of the invention, reference will now be made to the accompanying drawings, showing by way of illustration, a preferred embodiment thereof, and in which:

Figure 1 is a perspective view of a skate boot in accordance with the present invention;

Figure 2 is a top plan view thereof;

Figure 3 is a side elevation of the skate boot shown in Figure 1;

Figure 4 is an exploded view of the skate boot partly in cross-section shown from a side elevation thereof;

Figure 5 is an enlarged fragmentary elevation partly in cross-section of the skate boot;

Figure 6 is a vertical cross-section taken along lines VI—VI of Figure 3;

Figure 7 is a vertical cross-section taken along lines VII—VII of Figure 3;

Figure 8 is a horizontal cross-section taken along lines VIII—VIII of Figure 3;

Figure 9 is a front elevation thereof; and

Figure 10 is a rear elevation thereof.

Referring now to the drawings, a hockey skate 10 is illustrated in Figures 1 to 3 and 9 and 10 having a boot 16 to which is mounted a blade support 14 and a skate blade 12. The blade support 14 is of the molded plastics type, that is a steel blade 12 is inserted into a mold cavity while a plastic material is formed in the cavity. Of course, any other type of conventional blade can be utilized with the boot of the present construction.

The boot 16 includes a lower 18, an intermediate portion 20 and an upper 22. The lower is a one piece molded shell formed, utilizing conventional molding techniques presently used in molded plastic skate boots. The shell forming the lower 18 includes a toe zone 24, a metatarsal zone 26 and a heel zone 28. An opening or slot which is defined by edges 30 and 32, extends from the toe zone 24 through the metatarsal zone and is provided to receive eyelet bands as will be described later. The lower 18 also includes a sole 29 which of course, is formed as part of the shell making up the lower 18. The sole 29 in the zone 24 can be built up as shown in Fig. 5 in order to provide a more direct transfer of forces from the toes of the skater to the blade. The lower 18 includes upstanding edges 34 and 36 as seen in Figure 4, adapted to receive the intermediate portion 20 as will be described. The rear of the heel zone 28 of the lower 18 includes an upstanding tab 31 which forms part of the protection for the Achilles tendon.

The shell forming the lower 18 has a wall thickness in the toe zone 24 and the heel zone 28 as well as at the sole 29 such as to provide substantial rigidity and protection against impacts which may occur during the game of hockey such as, the reception of a hard hockey puck travelling at speeds in excess of 150 kilometers an hour or the sudden impact of a hockey stick or someone else's skate blade. The blade support 14 can be riveted to the sole 29 forming part of the lower 18. The sole 29 is sufficiently rigid to provide lateral stability to the blade support 14. The lower has an inverted trapezoidal shape, as shown in Figs. 9 and 10, in order to allow a greater degree of banking in turns.

The intermediate member 20 is molded having a U-shaped horizontal cross-section and is made of a softer material than the plastic material utilized for the lower 18. The intermediate member 20 or ankle portion has a bellow or corrugated construction in the sidewall thereof as illustrated by the bellows grooves 46. The intermediate member 20 also has lower side edges 50 which are adapted to overlap with the upstanding edges 34 and 36 on the lower. Seam 38 connects the overlapping edges on the sidewalls thereof but it is noted that the intermediate member 20 is not fixed to the lower 18 in the rear or Achilles tendon area. Rather, a lip 44 extends downwardly and overlaps freely with the upstanding tab 31 of the lower 18. This construction allows forward flexion of the boot. Grooves 46 are formed in the sidewalls of the intermediate member to provide flexibility for lateral flexibility in the ankle area of the boot and conformity to the ankle area of the foot. A bellows 54 is formed in both sidewalls of the intermediate member 20 below the grooves 46. The bellows is an arcuate bowed out portion thereof of thinner material. This allows for forward flexion lateral and torsional flexibility. The intermediate member 20 includes forwardly extending tabs or edges 58 shown in dotted lines in Figure 4, for instance. An upwardly extending tab 52 is provided on both sides as shown in dotted lines in Figure 4. The intermediate member 20 is made of a polyester based polyurethane having good memory.

An underlying nylon fabric sheet 62 is fixedly connected by stitching to the lower edge 50 of the intermediate member 20 along seam 38 and to the upper tab or edge 52. The nylon fabric sheet 62 is flexible but it has a high resistance to stretch when tension forces are applied thereto. The sheet enables the intermediate member 20 to flex laterally but prevents it from becoming elongated or from otherwise stretching.

Although only one side of the skate construction is illustrated in Figures 6 and 7, both sides of the skate are identical in construction. Accordingly, in describing the side of the intermediate member 20 in Figures 6 and 7, the same elements are provided in the other side of the intermediate member 20.

The intermediate member 20 is cut out in the Achilles tendon area and provides merely the height of the lip 44. The area within the boot behind the lip 44 is protected by the nylon fabric sheet 62. The intermediate member 20 is of a softer material than the lower and may be made of a polyurethane elastomer. Its construction is such as to provide a "prebroken" skate boot. The term is derived from the conventional leather skate. It is necessary when a new pair of leather skates are being "broken in" that the stiffness of the leather in the area of the ankle be made somewhat softer by repeated use so as to give the necessary flexibility but not to be soft to the point where the skate becomes useless. With the present intermediate member, the proper degree of breaking-in or flexibility is provided in the area of the ankle. The forward flexure is provided by the construction of the intermediate member 20 in the area of the Achilles tendon as previously described with respect to the upstanding tab 31 and the lip 44 which overlap but which are not directly connected. Further, as will be described, a similar provision is made between the intermediate member and the rear portion of the upper 22.

The upper 22 is made of leather and includes a pair of eyelet bands 80 and 82 extending within the slot defined by edges 30 and 32 furnished in the lower 18 for this purpose. The eyelet bands 80 and 82 are connected by stitching to the edges 30

and 32 of the lower 18. Each eyelet band 80 and 82 is furnished with eyelets 84. The eyelet bands 80 and 82 are also stitched to the forwardly extending tabs 58 on the intermediate member 20.

The upper 22 also includes a horizontally extending U-shaped leather collar band attached to the upper tab 52 of the intermediate 20 and has a downwardly extending leather Achilles tendon back 88, which is shaped to the form of the cut out in the rear of the intermediate member 20. The achilles tendon back 88 is stitched to a leather horizontal band 86 but is not stitched to the intermediate member. Rather, the Achilles tendon back 88 is underlaid by the nylon fabric sheet 62 which itself is stitched to the horizontal band 86. Finally, the leather upper is provided with a tendon guard 90 of conventional construction which is an upward extension of the Achilles tendon back 88.

A liner is fixed within the so-formed boot 16. The liner includes a laminated stiffener 92 in the area of the tendon guard 90 as shown in Figure 6 and a soft leather inlay 66 in the area of the intermediate member 20. The nylon sheet 62 can have a thin layer of cotton fabric 64 laminated thereto. Overlying the above mentioned inlays is a foam material layer 68 which extends from the top of the tendon guard to the sole. A thick E.V.A. thermo plastic heat formable foam pad 70 is provided in the area of the ankles. This material has the property of forming under body heat and is meant to block the boot against the ankles. Finally, a smooth soft conventional inner liner usually made of leather is provided and is identified by the numeral 71. The leather liner 71 is made in the form of the inner shape of the boot and is glued thereto while the above mentioned liner such as the foam liners 68 and nylon fabric 62 are only provided in the area of the ankles and heel but do not extend into the Achilles tendon area or the forward portion of the boot i.e., the metatarsal zone or the toe zone. A foot bed 73 may also be provided in the bottom of the boot.

A tongue 102 is fixed to the toe zone 24 of the lower 18 by means of a rivet 106. The tongue 102 is constructed of leather with a felt liner. A plastic cap 104 forms the leading portion of the tongue 102 and is the portion which is connected by the rivet 106. The upper surface of the toe zone 24 is provided with a lateral rib and woodruff key type abutments 108 and 110 while the plastic tab 104 has mating abutments 116 and 117 which allow the tongue 102 to be locked against rearward movement thereof without providing undue force on the rivet 106. The shape of the abutments also allows the tongue to be easily lifted to allow the foot to be inserted or removed from the boot. These abutments come into play only when the tongue is subjected to a tension force rearwardly thereof. The cap 104 adds further impact protection to that area of the foot between the toes and the metatarses.

In constructing the skate boot 16, the lower 18 is first injection molded in one piece as shown in Figure 4 for instance. The intermediate member 20 is formed separately and the upper is sewn to tabs 52 of the intermediate member 20. The inner layers are assembled together and then sewn to the so-formed intermediate and upper. The assembly is then inserted with glue to the lower 18 and the seams 38 are formed. The tongue is mounted by means of riveting. Similarly, the blade is attached to the sole of the boot by rivets which also can be utilized to hold down the foot bed 73.

Claims

1. A skate boot (16) including:

— a lower (18) comprising sole (29), toe (24), metatarsal (26) and heel (28) portions of the boot, and being made of a molded, unitary, rigid plastics material;

— an upper (22) including an upper tendon guard (90) covering the upper portion of the Achilles tendon,

characterized in that it further includes:

— an intermediate portion (20) between the lower (18) and the upper (22), said intermediate portion comprising ankle and Achilles tendon portions of the boot, and being connected to the upper edge (34, 36) of the lower, and the upper being connected to the upper edge of the intermediate portion,

— and an inner liner fixed to the lower (18), the intermediate portion (20) and the upper (22);

— in that the upper (22) further includes a pair of eyelet bands (80, 82), a collar (86) and an Achilles tendon back (88) depending therefrom,

— and in that the intermediate portion (20) is made of a molded plastics material relatively softer than the material utilized for the lower (18) such that the intermediate portion is relatively flexible compared to the lower, while the upper (22) is made of leather or the like pliable material such as to take the form of the foot through repeated use.

2. A skate boot as defined in claim 1, wherein the Achilles tendon portion of the intermediate portion (20) is unconnected to the lower (18) but overlaps with an upwardly extending portion (31) of the lower.

3. A skate as defined in claim 1, wherein the eyelet bands (80, 82) are provided in a slot defined in the lower (18) and fixedly connected to the respective edges (30, 32) of the lower defining the slot, the intermediate portion (20) including forwardly extending tabs (58) to which the eyelet bands (80, 82) are further connected.

4. A skate boot as defined in claim 1, wherein the collar band (86) of the upper is connected along the sides thereof to the intermediate portion (20), and the Achilles tendon back (88) of the upper extends downwardly such as to be complementary to the Achilles tendon portion of the intermediate portion.

5. A skate boot as defined in any one of claims 1 to 4, wherein the intermediate portion (20) has grooves (46) in the sidewalls thereof to enhance the flexibility of the skate boot in the ankle area.

6. A skate boot as defined in claim 1, wherein the inner liner includes a stretch resistant flexible sheet (62) underlying the intermediate portion (20), said flexible sheet being connected to the lower and to the upper marginal areas (50, 52) of the intermediate portion such as to allow lateral flexibility to the boot but to prevent elongation of the intermediate portion.

7. A skate boot as defined in claim 6, wherein the inner liner (92, 62, 64, 68, 70, 71) of flexible stretch resistant material is connected at least to the intermediate portion (20) and to the upper (22) along the margins of the intermediate portion so as to allow the intermediate portion to flex forwardly and laterally but to prevent elongation of the intermediate portion.

8. A skate boot as defined in claim 6, wherein the lower (18) further includes in the heel portion an upstanding member (31) extending over a portion of the Achilles tendon of the wearer, the intermediate portion having a protective section (44) thereof overlapping the upstanding member of the lower (18) but unconnected thereto, and the upper (22) having a downwardly extending back (88) complementing the top edge of the Achilles tendon portion of the intermediate portion such as to provide forward flexibility of the skate boot.

9. A skate boot as defined in claims 6 and 7, wherein the stretch resistant liner includes a nylon woven fabric (64) stitched to the lower (18) and to the upper (22) and underlying the intermediate portion (20).

10. A method of forming a skate boot according to any one of claims 1 to 9, comprising the steps of:

— molding, from plastics material, a lower (18) of unitary construction defining sole (29), toe (24), metatarsal (26) and heel (28) portions of the boot provided with an upstanding continuous edge (30, 32, 34, 36) defining in part an opening for receiving eyelet bands and an intermediate portion;

— molding, from plastics material relatively softer than the material utilized for the lower (18), an intermediate portion (20), such that said intermediate portion is relatively flexible compared to the lower;

— fixing an upper (22) including eyelet bands (80, 82), to the upper edge of the intermediate portion (20) at least along the sides thereof;

— forming an inner liner (92, 62, 64, 68, 70, 71) and fixing the inner liner to the upper (22) and intermediate portion (20);

— inserting the so-formed assembly into the lower (18), and

— fixing the intermediate portion (20) along its sides to the upstanding edge (30, 32) of the lower (18) and otherwise fixing the inner liner as well as the eyelet bands of the upper (22) to the lower.

Patentansprüche

1. Eislaufschuh (16) mit einer unteren Schale (18), welche eine Sohle (29), einen Zehenbereich (24), einen Mittelfußbereich (26) und Fersenabschnitte (28) des Schuhs aufweist und aus einem gegossenen bzw. geformten einstückigen festen Kunststoffmaterial hergestellt ist;

und mit einer oberen Schale (22) mit einem oberen Sehnenschutz (90), der den oberen Bereich der Achillessehne bedeckt,

gekennzeichnet durch einen dazwischenliegenden Abschnitt (20) zwischen der unteren Schale (18) und der oberen Schale (22), wobei der dazwischenliegende Abschnitt Knöchel- und Achillessehenenbereiche des Schuhs aufweist und mit der Oberkante (34, 36) der unteren Schale verbunden ist, und wobei die obere Schale mit der oberen Kante des dazwischenliegenden Abschnittes verbunden ist,

ein Innenfutter, welches an die untere Schale (18), den dazwischenliegenden Abschnitt (20) und die obere Schale (22) befestigt ist,

und daß die obere Schale (22) außerdem ein Paar Ösengruppen (80, 82), ein Ringstück (86) und eine davon ausgehende Achillessehnenrückseite (88) aufweist,

und daß der dazwischenliegende Abschnitt (20) aus einem gegossenen Kunststoffmaterial besteht, welches relativ weicher ist als das für die untere Schale (18) verwendete Material, so daß der dazwischenliegende Abschnitt relativ flexibel ist verglichen mit der unteren Schale, während die obere Schale (22) aus Leder gebildet ist oder ähnlichem biegsamen Material, um die Form des Fußes durch wiederholtes Tragen anzunehmen.

2. Eislaufschuh nach Anspruch 1, dadurch gekennzeichnet, daß der Achillessehenenabschnitt des dazwischenliegenden Abschnittes (20) nicht mit der unteren Schale (18) verbunden ist, aber mit einem sich nach oben erstreckenden Abschnitt (31) der unteren Schale überlappt.

3. Eislaufschuh nach Anspruch 1, dadurch gekennzeichnet, daß die Ösengruppen (80, 82) in einen Schlitz der unteren Schale (18) eingesetzt und fest mit den jeweiligen Kanten (30, 32) der unteren Schale, welche den Schlitz bilden, verbunden sind, wobei der dazwischenliegende Abschnitt (20) sich nach vorne erstreckende Zungen (58) aufweist, mit welchen die Ösengruppen (80, 82) weiterhin verbunden sind.

4. Eislaufschuh nach Anspruch 1, dadurch gekennzeichnet, daß das Ringband (86) der oberen Schale entlang seiner Seiten mit dem dazwischenliegenden Abschnitt (20) verbunden ist, und wobei die Achillessehnenrückseite (88), der oberen Schale sich nach unten erstreckt, um komplementär zu dem Achillessehnenabschnitt des dazwischenliegenden Abschnittes zu sein.

5. Eislaufschuh nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der dazwischenliegende Abschnitt (20) in seinen Seitenwänden Rillen (46) aufweist, um die Flexibilität des Eislaufschuhs im Knöchelbereich zu vergrößern.

6. Eislaufschuh nach Anspruch 1, dadurch gekennzeichnet, daß das Innenfutter eine reißfeste flexible Lage (62) aufweist, die den dazwischenliegenden Abschnitt (20) unterlegt, wobei die dehnbare Lage mit der unteren Schale und den oberen Randbereichen (50, 52) des dazwischen-

liegenden Abschnittes verbunden ist, um seitliche Flexibilität für den Schuh zu ermöglichen, aber um eine verlängerung des dazwischenliegenden Abschnittes zu verhindern.

7. Eislaufschuh nach Anspruch 6, dadurch gekennzeichnet, daß das Innenfutter (92, 62, 64, 68, 70, 71) aus dehnbarem reißfestem Material mindestens mit dem dazwischenliegenden Abschnitt (20) und der oberen Schale (22) entlang den Rändern des dazwischenliegenden Abschnittes verbunden ist, um es dem dazwischenliegenden Abschnitt zu ermöglichen, sich nach vorne und seitlich auszudehnen, aber um eine Verlängerung des dazwischenliegenden Abschnittes zu verhindern.

8. Eislaufschuh nach Anspruch 6, dadurch gekennzeichnet, daß die untere Schale (18) weiterhin in dem Fersenabschnitt ein nach oben stehendes Teil (31) aufweist, welches sich über einen Abschnitt der Achillessehne des Trägers erstreckt, wobei der dazwischenliegende Abschnitt einen Schutzabschnitt (44) aufweist, welcher das nach oben stehende Teil des unteren Abschnittes (18) überlappt, aber damit unverbunden ist, und wobei die obere Schale (22) eine sich nach unten erstreckende Rückseite (88) aufweist, welche die obere Kante des Achillessehnenabschnittes des dazwischenliegende Abschnittes ergänzt, um eine nach vorne gerichtete Flexibilität des Eislaufschuhs zu ergeben.

9. Eislaufschuh nach den Ansprüchen 6 und 7, dadurch gekennzeichnet, daß das reißfeste Innenfutter ein Nylonstoffgewebe (64) aufweist, welches an die untere Schale (18) und an die obere Schale (22) angenäht ist, und den dazwischenliegenden Abschnitt (20) unterlegt.

10. Verfahren zur Herstellung eines Eislaufschuhs nach einem der Ansprüche 1 bis 9, welches die folgenden Schritte aufweist:

— Gießen bzw. Formen einer unteren Schale (18) aus Kunststoffmaterial in einstückiger Ausgestaltung, welche die Sohle (29), den Zehenbereich (24), den Mittelfußbereich (26) und den Fersenbereich (28) des Schuhs bildet, und welche mit nach oben stehenden umlaufenden Kanten (30, 32, 34, 36) versehen ist, die teilweise eine Öffnung zum Aufnehmen von Ösengruppen und einem dazwischenliegenden Abschnitt bilden;

— Gießen bzw. Formen eines dazwischenliegenden Abschnittes (20) aus Kunststoffmaterial, welches relativ weicher ist als das für die untere Schale (18) verwendete, so daß der dazwischenliegende Abschnitt relativ flexibel ist verglichen mit der unteren Schale;

— Befestigen einer Ösengruppen (80, 82) enthaltenden oberen Schale (22) an die obere Kante des dazwischenliegenden Abschnittes (20) mindestens entlang seiner Seiten;

— Formen eines Innenfutters (92, 62, 64, 68, 70, 71) und Befestigen des Innenfutters an die obere Schale (22) und den dazwischenliegenden Abschnitt (20);

— Einsetzen des so geformten Gefüges in die untere Schale (18); und

— Befestigen des dazwischenliegenden Abschnittes (20) entlang seiner Seiten an den hochstehenden Kanten (30, 32) der unteren Schale (18), und andererseits Befestigen des Innenfutters sowie der Ösengruppen der oberen Schale (22) an der unteren Schale.

Revendications

1. Chaussure de patinage (16) comportant:

— une portion inférieure (18) comprenant les portions de la chaussure correspondant à la semelle (29), aux orteils (24), au metatarse (26) et au talon (28) et fabriquée en un matériau plastique rigide, moulé d'une seule pièce;

— une portion supérieure (22) comprenant une protection supérieure (90) de tendon couvrant la portion supérieure du tendon d'Achille,

caractérisée en ce qu'elle comporte en outre:

— une portion intermédiaire (20) entre la portion inférieure (18) et la portion supérieure (22), ladite portion intermédiaire comprenant des portions de la chaussure correspondant à la cheville et au tendon d'Achille et étant reliée au bord supérieur (34, 36) de la portion inférieure, et la portion supérieure étant reliée au bord supérieur de la portion intermédiaire,

— et une doublure intérieure fixée à la portion inférieure (18), à la portion intermédiaire (20) et à la portion supérieure (22);

— en ce que la portion supérieure (22) comporte en outre une paire de bandes à oeillets (80, 82), un collet (86) et une partie arrière (88) couvrant le tendon d'Achille et suspendue à ce collet,

— et en ce que la portion intermédiaire (20) est fabriquée en un matériau plastique moulé relativement plus souple que le matériau utilisé pour la portion inférieure (18) de façon telle que la portion intermédiaire soit relativement flexible, comparée à la portion inférieure, tandis que la portion supérieure (22) est fabriquée en cuir ou matériau pouvant se plier de façon à prendre la forme du pied par usage répété.

2. Chaussure de patinage selon la revendication 1, dans laquelle la portion, couvrant le tendon d'Achille, de la portion intermédiaire (20) n'est pas reliée à la portion inférieure (18), mais se recouvre avec une portion (31), qui s'étend vers le haut de la portion inférieure.

3. Chaussure de patinage selon la revendication 1, dans laquelle les bandes à oeillets (80, 82) sont placées dans une fente définie dans la portion inférieure (18) et reliées de façon fixe aux bords respectifs (30, 32) de la portion inférieure qui définissent la fente, la portion intermédiaire (20) comprenant des pattes (58) qui s'étendent vers l'avant et auxquelles les bandes à oeillets (80, 82) sont en outre reliées.

4. Chaussure de patinage selon la revendication 1, dans laquelle la bande formant collet (86) de la portion supérieure est reliée, le long de ses côtés, à la portion intermédiaire (20); et dans laquelle la portion arrière (88), qui couvre le tendon d'Achille, de la portion supérieure s'étend

vers le bas de façon à être complémentaire de la portion, qui correspond au tendon d'Achille, de la portion intermédiaire.

5. Chaussure de patinage selon l'une quelconque des revendications 1 à 4, dans laquelle la portion intermédiaire (20) présente des rainures (46) dans ses parois latérales pour améliorer la flexibilité de la chaussure de patinage dans la zone de la cheville.

6. Chaussure de patinage selon la revendication 1, dans laquelle la doublure intérieure comporte une nappe flexible (62) résistant à l'étirage et située sous la portion intermédiaire (20), ladite nappe flexible étant reliée aux zones de bordure inférieure et supérieure (50, 52) de la portion intermédiaire de façon à permettre une flexibilité latérale à la chaussure mais à empêcher l'allongement de la portion intermédiaire.

7. Chaussure de patinage selon la revendication 6, dans laquelle la doublure intérieure (92, 62, 64, 68, 70, 71) de matériau flexible résistant à l'étirage est reliée au moins à la portion intermédiaire (20) et à la portion supérieure (22) le long des bordures de la portion intermédiaire de façon a permettre à la portion intermédiaire de fléchir vers l'avant et latéralement mais à empêcher l'allongement de la portion intermédiaire.

8. Chaussure de patinage selon la revendication 6, dans laquelle la portion inférieure (18) comporte en outre, dans la portion du talon, un élément vertical (31) qui s'étend sur une portion du tendon d'Achille de l'utilisateur, la portion intermédiaire présentant une section de protection (44) qui recouvre l'élément vertical de la portion inférieure (18) mais ne lui est pas reliée, et la portion supérieure (22) présentant une partie arrière (88) qui s'étend vers le bas et qui complète le bord supérieur de la portion, qui correspond au tendon d'Achille, de la portion intermédiaire de façon à assurer la flexibilité de la chaussure de patinage vers l'avant.

9. Chaussure de patinage selon les revendications 6 et 7, dans laquelle la doublure résistant à l'étirage comporte un tissu de nylon (64) cousu à la portion inférieure (18) et à la portion supérieure (22) et passant sous la portion intermédiaire (20).

10. Procédé de formage d'une chaussure de patinage selon l'une quelconque des revendications 1 à 9, comportant les étapes de:

— mouler, en matériau plastique, une portion inférieure (18), construite d'une pièce, définissant les portions correspondant à la semelle (29), aux orteils (24), au métatarse (26) et au talon (28) de la chaussure, et présentant un bord continu vertical (30, 32, 34, 36) qui définit en partie une ouverture pour recevoir des bandes à oeillets et une portion intermédiaire;

— mouler, en matériau plastique relativement plus souple que le matériau utilisé pour la portion inférieure (18), une portion intermédiaire (20) de façon telle que ladite portion intermédiaire soit relativement flexible en comparaison de la portion inférieure;

— attacher une portion supérieure (22), comprenant des bandes à oeillets (80, 82) au bord supérieur de la portion intermédiaire (20), au moins le long de ses côtés;

— former une doublure intérieure (92, 62, 64, 68, 70, 71), et attacher la doublure intérieure à la portion supérieure (22) et à la portion intermédiaire (20);

— insérer l'ensemble ainsi formé dans la portion inférieure (18), et

— attacher la portion intermédiaire (20), le long de ses côtés, au bord vertical (30, 32) de la portion inférieure (18), et attacher par ailleurs la doublure intérieure, ainsi que les bandes à oeillets de la portion supérieure (22), à la portion inférieure.

Fig. 1

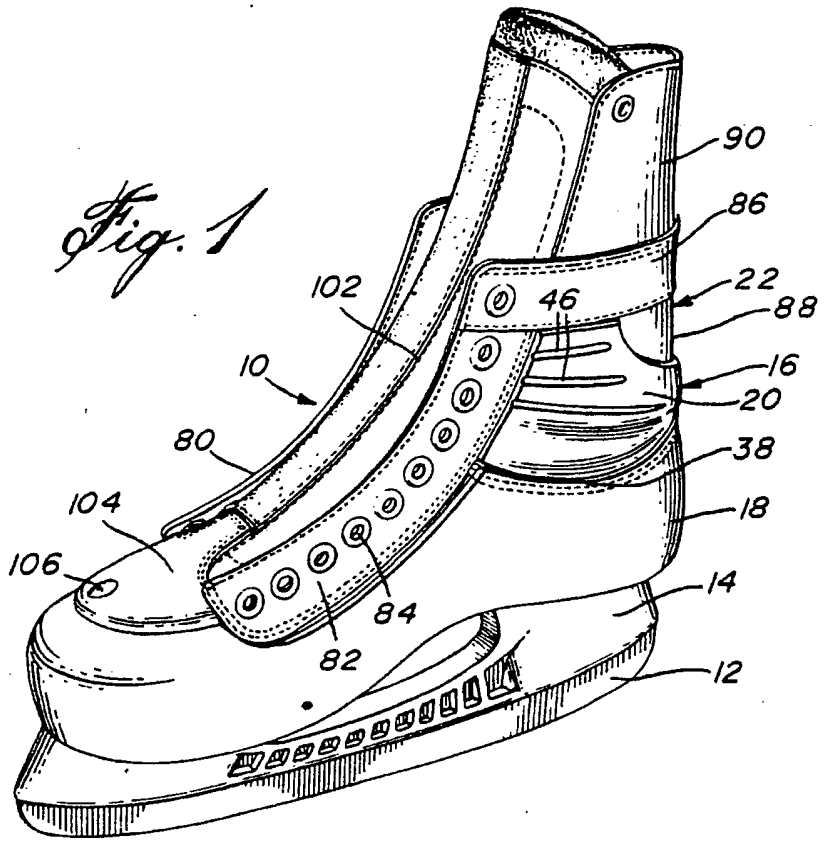
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Fig. 2

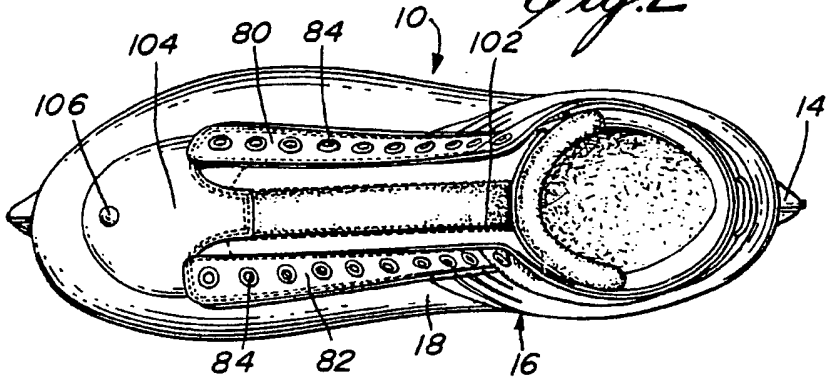
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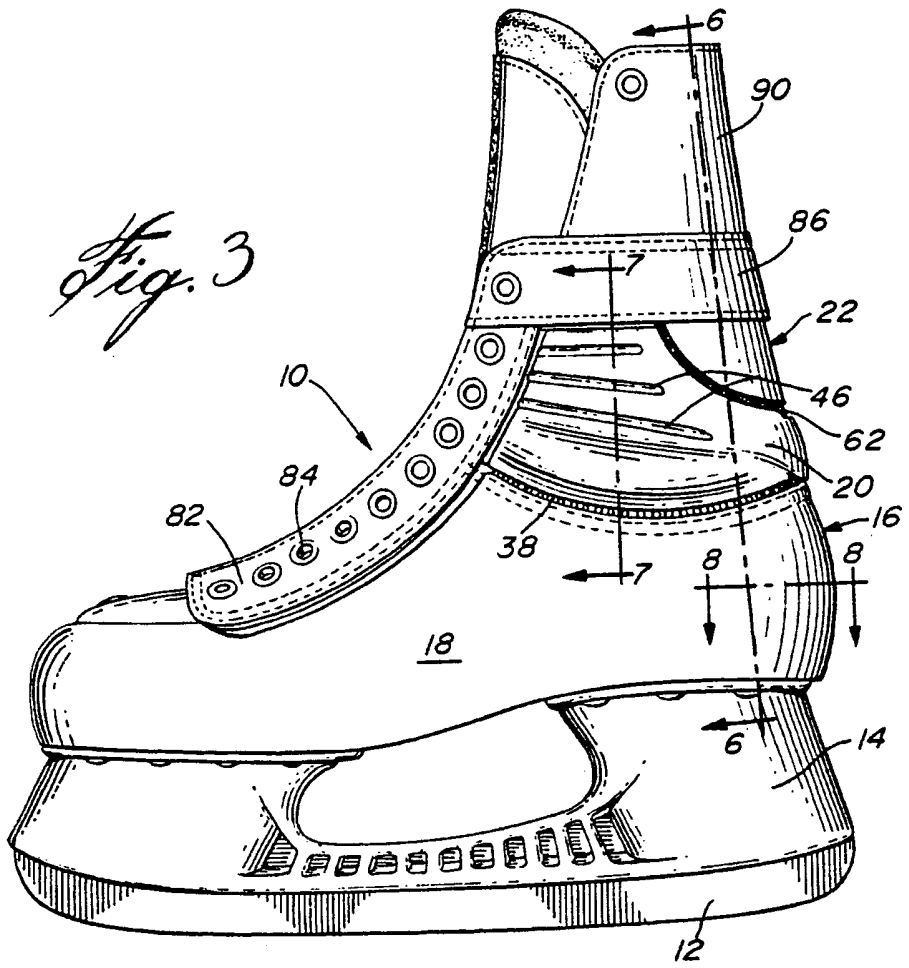
Fig. 3



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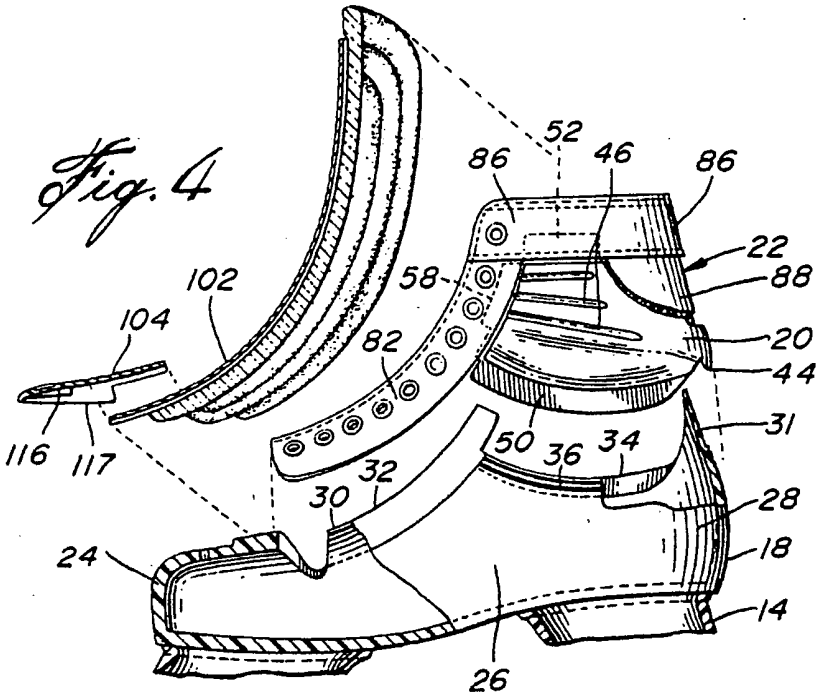
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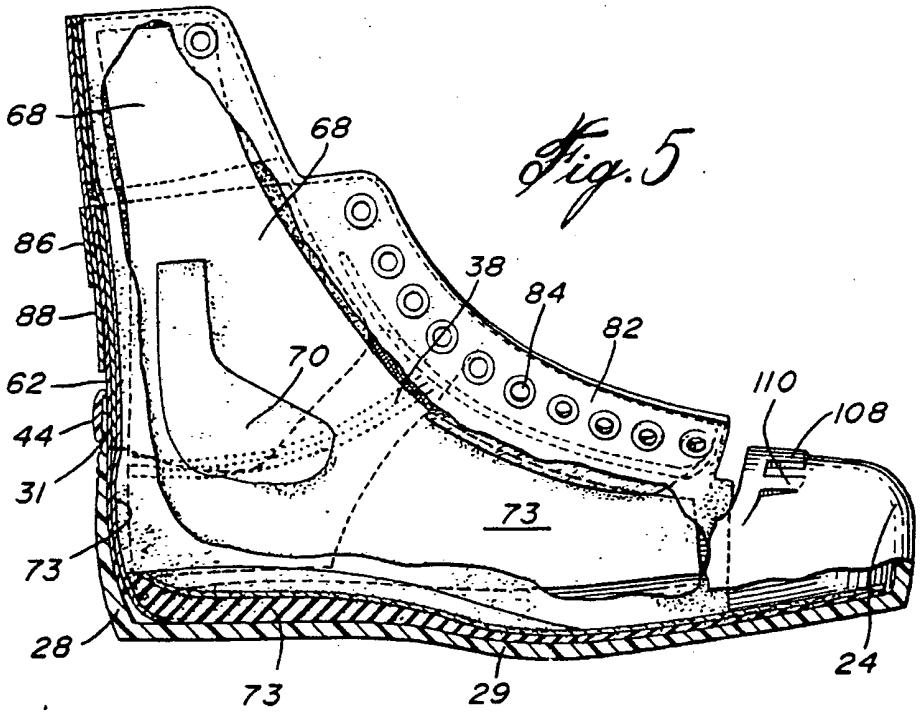
Fig. 5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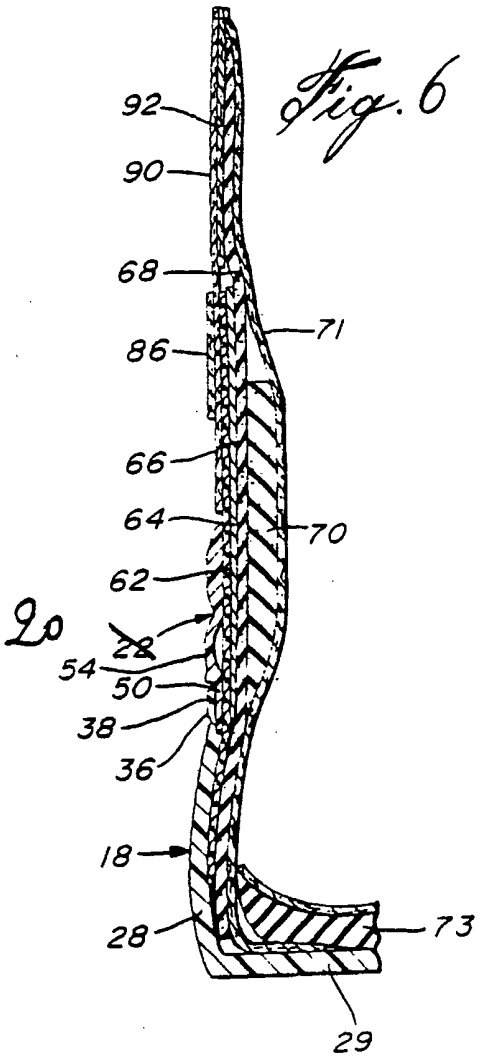

Fig. 6

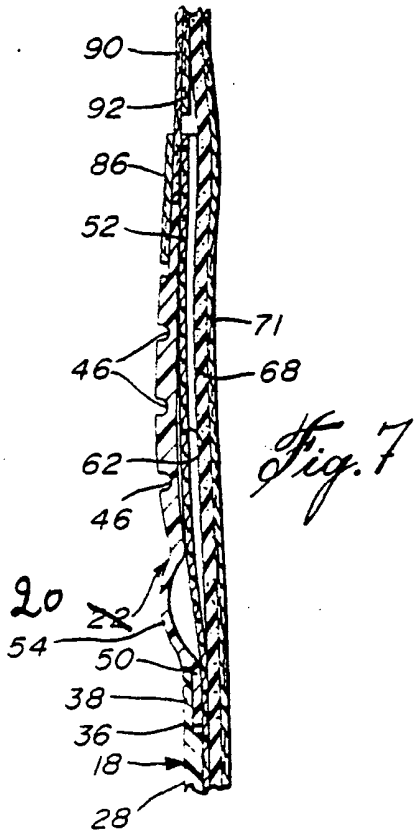

Fig. 7

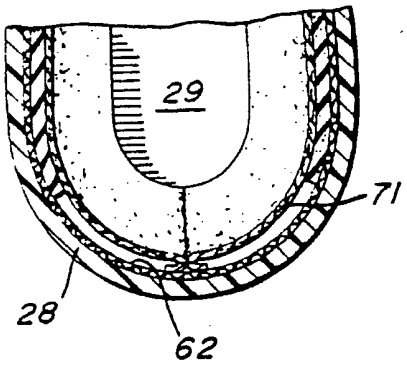

Fig. 8

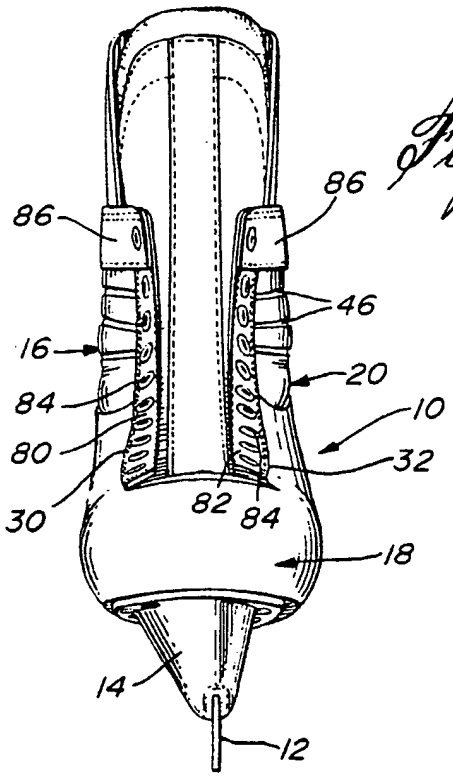
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Fig. 9

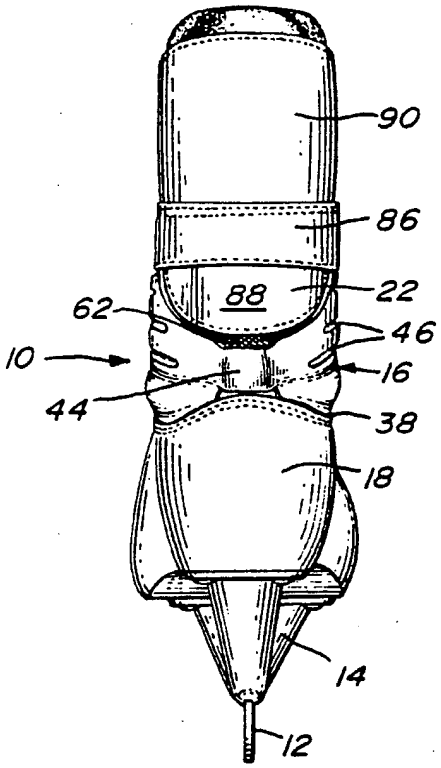
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Fig. 10